Exploring effective factors of nutritional self-care in women with metabolic syndrome based on Pender's Health Promotion Model

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ABSTRACT

Nutritional self-care can be noticed as one of the main both care and control procedure of metabolic syndrome that is playing an important role in forming cardiovascular diseases, type 2 diabetes and apoplexy. This study was aimed at investigating effective factors of nutritional self-care in women with metabolic syndrome based on Pender's Health Promotion Model. A cross-sectional study was done. 329 women with syndrome metabolic who referred to treatment quintet centers of Isfahan oil petroleum in 2012 years through systematic sampling were selected. Data were gathered by a researcher made questionnaire in 11 sections that designed based on health promotion model constructs that its validity and reliability were determined separately. Data were finally analyzed by SPSS (ver.16) with confidence level of 95%. The mean score of nutritional self-care of patients was 35.10. The mean score of health promotion model constructs were approximately average or less than average. There was a significant relationship between nutritional self-care and knowledge, perceived benefits, perceived self-efficacy, situational influences, spouse social support and commitment to plan of action, furthermore; there was a significant inverse relation between perceived barriers, activity related affect and immediate competing demands and preferences with nutritional self-care. Results were maintained that nutritional self-care in women with syndrome metabolic is not pleasure, according to relation of nutritional self-care with health promotion model constructs, therefore; mentioned model can be beneficial for educational intervention in terms of having healthy dietary of these patients.

KEYWORDS: self-care, nutrition, health promotion model, syndrome metabolic.

INTRODUCTION:

metabolic syndrome or X syndrome means occurring cardiovascular risk factors including abdominal obesity, hypertension, impaired insulin metabolism and lipid disorders (increase triglyceride and LDL and decrease HDL) (1,2). This disease called with other names such as insulin resistance syndrome and dysmetabolic syndrome (3). Although; there are numerous definitions for diagnosing metabolic syndrome, but the most applicable clinical diagnostic method is using ATP III criterion (Adult Treatment Panel) that patient must has 3 factors of cardiovascular disease risk factors simultaneously, at least, based on aforementioned definition (4).

The importance of this syndrome becomes apparent when it was found that the overall mortality of this syndrome will be increased around 20 to 80 % (5). The prevalence of syndrome is 23.7%, 19.8% and 23.9% in the United States of America, Greece and Portugal, respectively (6-8) and, it is reported 15 to 30% all around the world, totally (9,10). In this regard, surveys showed that syndrome metabolic prevalence of Iran is more than 30% (11). Of course, it must be noticed that prevalence is more among women outlive men (12).

On the other hand, self- care is affected by individual, mental and social factors that recognition of them can help health services providers to design and execute effective and beneficial intervention for promoting self-management behavior regarding chronic diseases. Self-care is an active and practical process that done by patient and it seems necessary for preventing of short- time and long- time effects (13). Self-care, in fact, is a collection of defined behaviors that patients with chronic diseases (such as mentioned syndrome) implement to control their disease more completely, daily. This manners can be included organize dietary, exercise; consume

drugs and etc … (14). The vast majority of studies present that self-care will result in patient improvement and healthy status (15).

Nevertheless; several investigation reported that doing self-care behavior among patients with chronic disease such as patient with syndrome metabolic was low and delineate that lack of medical program is a main complication for their treatment, as well, and lack of self-care in this group is reported 30 to 60% (16,17). In fact, different surveys all around the world maintain that disease management is not favorable, even developed countries (18).

Regarding nutritional self-care, the most patients do not actually notice to nutritional guidelines, in this way that less than half of patients in Asian countries and other ones accepted healthy dietary as a part of their treatment (19). Dietary is a complex behavior that is not easily to change, even if the person is able to change, maintain the new behavior is difficult. Studies of other countries delineate that considering dietary comments by patients with metabolic diseases is difficult, and the most patients also do not implement recommendations (20). Other studies all over the world also maintain nutrition bad habits (21-23).

Some of studies, in Iran, also delineate poor nutritional self-care among patients with type 2 diabetes (around 90%), Despite having adequate knowledge of healthy dietary recommendation (24). Nutritional behavior of individual is not only affected by nutritional literacy and knowledge, moreover; it can be changed by numerous factors (25). Some of scholars believe that raising knowledge is not adequate singly to start and maintain self-care behaviors and certainty of long-term control (26).

According to problems associated with forming and maintaining of self-care behavior, and its complexity, behavior changes theories is needed to be used (27). In order to, theories and models determine main factors of behaviors and also specify relation of these factors. Health promotion model is one of the applicable models that can be beneficial in terms of having healthy dietary and proper nutritional behavior.

Aforementioned models is one of the health promoter models that make a frame for describing healthy manners those focused on persuading individuals towards positive status and raising well-being. Health promotion model accentuate on importance of cognitive process for controlling of behavior. In this model, health promotion behavior determining factors are included person characteristics and experiences, cognition and specific emotions of behavior. According to this model, health promoter behaviors considered as activities that will achieved based on people lifestyle. This model is utilizable for each healthy behavior that threat is not a significant source of motivation for behavior. This model describes how people make a decision on health promoter specific behavior (28). Current survey is designed to investigate effective factors of nutritional self-care of women with metabolic syndrome based on health promotion model.

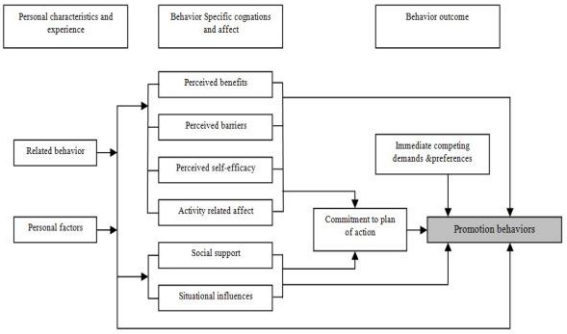

Figure 1: Pender's Health Promotion Model

MATERIAL AND METHODS

A correlation and cross-sectional survey was conducted. The study population included all women with metabolic syndrome in Isfahan. A systematic sample of women with metabolic syndrome (collection of metabolic disorders that is in relevance with increase triglyceride, decrease HDL-C, body obesity, hypertension and hyperglycemia) who referred to treatment quintet centers of Isfahan petroleum industry health organization during 3 month in 2012 year were selected. 329 samples were selected on the basis of Power 80%, significant level 5%, degrees of freedom 30 and maximum RMSE of 5%. Inclusion criteria were items including marriage, having writing and reading literacy and spending at least 3 months after their involvement in this syndrome. Exclusion criteria were factors such as being pregnant, Genetic disease, chronic infection, or severe disease, age less than 35 years and more than 60 years, having surgical experience in the last 3 months and had a mental illness.

A researcher made questionnaire was used due to lack of both standardized questionnaire in terms of nutritional self- care of patients with metabolic syndrome and assessment of health promotion model constructs. To achieve this goal, research team attempted to design and assess the validity and reliability of questionnaire. In this step, face and content validity were measured using criteria including CVI (Content Validity Index) and CVR (Content Validity Rate) and gathering recommendation of 17 specialists regarding health education, nutrition moreover; in the next step, Questions less than 0.75 were deleted. To measure reliability, internal consistency (at least .080) was used, moreover; to measure external consistency, test- retest (2 weeks interval) with ICC criterion (at

least 0.900) in the significant level of less than 0.001, was applied. Approved final questionnaire was consists of 11 districts, demographic questions (6 questions), knowledge (14 questions correctly or incorrectly), perceived benefits (Question 8 by 4-choice Likert Attitude Scale), perceived barriers (8 items by scale attitude 4-item Likert), perceived self-efficacy (10 question based on a scale of 10 options), activity related affect (8 items by 4-choice Likert attitude Scale), situational influences (8 questions based on 5 choices scale), spouse social support (12 questions based on a scale of 10 options), commitment to plan of action (10 questions based on a scale of 5 choices) and the immediate competing demands and preferences (14 questions based on 2 option scale) and nutritional care (12 questions based on a scale of 5 choices). Therefore; The knowledge questionnaire scores ranged between 0-14, perceived benefits 8-32, perceived barriers 8-32, perceived self-efficacy 10-100, activity related affect 8-32, situational influences 8-40, spouse social support 12-120, commitment to plan of action 10-50, immediate competing demands and preferences 0-14 and nutritional care 12-60.

To respect ethical issue, data were collected by consider to secretly gathering without pointing to individual traits, patients awareness and made organization by Isfahan University of Medical Science and deputy of drug and treatment of Isfahan petroleum industry health organization.

To analyze, SPSS (ver.16) was used, statistical test including frequency, mean, standard deviation, independent t- test, ANOVA, correlation matrix of main variables with confidence level of 0.95% were also implemented.

RESULTS

The mean age of patients was 44.81 ± 8.04 years and the mean duration of syndrome involvement was 2.05 ± 0.88 years. 1.2% (n=4) had primary education, 8.2% (n = 27) guide, 6.2% (n =185) high school, 34.3% (n=113) had an academic degree. The 41.3% (n=136) were employed and 58.7% (n=193) were housewives.

Based on the results of the survey, only 16.72% of the patients with metabolic syndrome were reported that consumed wholemeal bread, continuously. Frequency of nutritional self- care status of women with metabolic syndrome described in table 1, in detail.

Table 1: Frequency of nutritional self-care status of women with metabolic syndrome

	always		most often		sometimes		rarely		never	
	N	%	N	%	N	%	N	%	N	%
Consumption of wholemeal bread	55	16.7	39	11.8	174	52.8	53	16.1	8	2.4
Consumption of fish	21	6.3	35	10.6	53	16.1	144	43.7	76	23.1
Consumption of low- fat dairy	101	30.7	89	27.0	62	18.8	49	14.8	28	8.5
Consumption of soya	35	10.6	74	22.4	99	30.0	53	16.1	68	20.6
Consumption of fruit or vegetable	212	64.4	83	25.3	30	9.1	4	1.2	0	0
Consumption of fried foods	179	54.4	98	29.7	31	9.4	17	5.1	4	1.2
Consumption of pastry cream	11	3.3	51	15.5	120	36.4	102	31.0	45	13.6
Consumption of low- salt foods	96	29.1	115	34.9	96	29.1	18	5.4	4	1.2
Consumption of liquid vegetable oil	152	46.2	93	28.2	30	9.1	30	9.1	24	7.2
Consumption of raw nuts	10	3.0	43	13.0	89	27.0	97	29.4	90	27.3
Consumption of cereal	51	15.5	35	10.6	160	48.6	44	13.3	39	11.8
Consumption of beverage	41	12.4	168	51.0	92	27.9	16	4.8	12	3.6

The mean and standard deviation of nutritional self-care was 35.10 ± 10.27 score. The mean scores for health promotion model constructs are given in Table 2.

Table 2: The mean and standard deviation score of health promotion model constructs in study group.

Surveyed constructs	Mean	Standard deviation	Range of gained scores	Range of obtainable scores
knowledge	7.69	2.07	2-14	0-14
Perceived benefits	24.26	3.27	19-32	8-32
Perceived barriers	28.12	4.84	13-32	8-32
Perceived self-care	47.89	20.36	10-100	10-100
Activity related affect	23.24	2.31	18-26	8-32
Situational influences	25.95	5.00	16-35	8-40
Spouse social support	65.48	24.01	36-120	12-120
Commitment to plan of action	30.52	4.36	30-45	10-50
Immediate competing demands and preferences	8.59	1.48	6-12	0-14
Nutritional self- care	35.10	10.27	18-51	12-60

Pearson correlation test showed that there is a direct and significant relationship between self-care and constructs including knowledge, perceived benefits, perceived self- efficacy, situational influences, spouse social support, commitment to plan of action and immediate competing demands and

preferences, on the other hand, there is a inverse significant relationship between nutritional self-care and constructs such as perceived barrier and activity related affect (table 3).

Table 3: Correlation matrix between nutritional self-care and health promotion model constructs of studied women.

		1	2	3	4	5	6	7	8	9
Nutritional self- care	r	0.433	0.521	-0.579	0.648	-0.463	0.426	0.687	0.603	-0.491
	p	0.006	<0.001	<0.001	<0.001	0.037	0.022	<0.001	<0.001	0.003

Numbered rows pointed to: 1- Knowledge 2- Perceived benefits 3- perceived barriers 4- perceived self-care 5- activity related affect 6- situational influences 7- spouse social support 8- commitment to plan of action 9- immediate competing demands and preferences.

Results also presented that there is a significant inverse relationship between age and nutritional self- care (r=-0.312, P=0.012). Independent T-test also maintained that nutritional self-care of housewife women is significantly more than employed women (P=0.008). ANOVA test described that there is significant difference about mean score of women nutritional self-care based on education (P=0.026). Results of PostHoc tests showed that women with academic education have high self-care scores mean compared to other groups.

DISCUSSION

In this survey, nutritional self-care status of patients with metabolic syndrome was moderate. While it was found that all the patients were aware of their condition but they were not acted properly in terms of dietary. It seems that chronic nature of the syndrome can lead to decreased motivation for doing self- care. In the current investigation, consumption of whole meal bread, fish, low fat diary, soya, raw nuts, grain were not suitable. Despite nutrition specialist recommendation regarding consume aforementioned foods, patient with metabolic syndrome were poorly consumed that. On the opposite site, these patients pay more attention to nutritional recommendation about consume cookie. This finding suggest that patients more than anything else in their diet were pay attention to cookie limitation that describes patients believes in terms of considering dietary.

On the other hand, unfortunately, Consumption of fried foods was high in patients. It is not surprising that fried stuffs consumption is high among Iranian because of food habits and taste of them. But nutritionists advise patients to use steamed or boiled foods. In the recent decades, there have been a lot of changes in dietary patterns in habitants of the Middle East, based on reports, over the last 30 years fat consumption has doubled in Iran (29).according to Moghadasi survey, Many of the subjects most days of the week were used hydrogenated oil, and women more than men were consumed butter, cream and hydrogenated oil (30). Adverse nutritional conditions showed in other studies as well, in this way that, fish intake is not good in other studies (31).

However, an analysis of 10 cohorts has shown that consumption of 10 grams of cereal fiber was associated with a 10% reduction in progression of atherosclerosis (32). In other studies, grain intake is inversely associated with metabolic syndrome (33). Esmaielzadeh survey (34) and other (35, 36) presented that High intake of grains is in relevance with lower serum insulin concentrations. The unfavorable conditions of nutritional care in this study were obtained while, investigation in United States (37) and Greece (38) show that consumption of fruits, vegetables and low-fat dairy products will result in reduction of metabolic syndrome risk. McKeown and et al maintained that the consumption of grains is a protective factor for metabolic risk factors associated with this syndrome (39). Nevertheless, Iranian studies suggest low consumption of grains (40). Blue and colleagues reported that consumption of high-fiber diet, olive oil, fruits, vegetables and nuts are associated with a reduced risk of metabolic syndrome (41). Mohajeri and Navaee study regarding diabetes patents dietary showed that high fat consumption was immensely common for these patients (42, 43).

The results showed that the mean scores of the health promotion model constructs about nutritional self-care were not favorable and in some cases, constructs mean was not even moderate. Results also maintained that self-care was significantly in relevance with spouse social support. In other words, with increasing support from the spouse, nutritional self-care increases. Gillibrand (44) and Albright study (45), Showed a significant positive relationship between social support and self-care behaviors. Aforementioned scholars said that family and social factors are strongly in accordance with self-care behavior, especially in terms of dietary. In Vijan survey, in patient's point of view, lack of family and social support was one of barriers for considering nutritional recommendation. In this investigation, people who were more supported by the family were more committed to healthy dietary (46). Glasgow also represent that family support is the most powerful determinant factor for doing dietary therapy in metabolic patients (47).

This study showed that increased self-efficacy will result in proper self-care behaviors regarding dietary. These findings were associated with Bernal, Wen, Walker, Von and Bond studies. Bernal investigated self- efficacy correlation regarding adult's diabetes self-care and concluded that self-efficacy was associated with self- care in terms of dietary (48). Walker (50) and Von (51) studies also maintain the role of self-efficacy as predictors of eating behaviors according to the results of the regression analysis. In Bonds (52) exploration, there was a significant relationship between individual self- efficacy and self- care.

The findings also suggested that the commitment to the implementation of the performing self-care behaviors (self-care) was related to the implementation of the performing these behaviors. Other studies reported that commitment to the patients self-care with diabetes was low and lack of accept of treatment program is likely a main problem for patient treatment and it is varied between 30% to 60%. In Harris study, for example, 35% to 75% of people were not committed to consider dietary (55). Despite strong evidence about the effect of diet on control metabolic disease, change dietary and it's maintain seems difficult. No commitment to diet recommendations even with adequate knowledge is expressed in some studies (56, 57). Story noticed to motivation crucial role of dietary commitment and also expressed that its lack is the most important factor of lifestyle modification programs failure (58).

In this study, there is a significant relationship between perceived benefits and nutritional self-care, as well. Of course, there were similar results in other surveys. Pinto reported that perceived benefits will lead to increased self-care of diabetes (59). Koch (60) and Patino (61) reported that there was a significant relationship between patient perception of benefits and self-care benefits with their adherence to these behaviors. Toobert study (62), also reported the same findings. Abood survey reflects the fact that with increased understanding of the benefits self-care behavior by diabetes patients, it wills more occur (63). Wen (49) showed that pure benefits (perceived benefits minus perceived barriers) are associated directly with self-care behaviors.

There was also a significant relationship between situational influences and self-care regarding healthy dietary. In fact, person's situation or context perception can facilitate or inhibit behavior. Situational influences of health promoter behavior are included perception of accessible options, demand characteristics and environmental aesthetics. Several qualitative studies explored the reason of lack of favor self-care implementation in patients with diabetes and introduced individual and environmental factors as barrier for providing diabetes care (64, 65). Davison by introducing a mental model of disease risk factors, individual traits, family, peers, and environment and, in a large scale, social and culture characteristics of each society believe that these items are necessary to be considered exactly before design any intervention (66). In another study, forgetfulness, both lack of access to healthy food in the restaurant and ideas for cooking were main barriers to achieve the dietary goals (67). Rojas was believed that social environment would not provided people with adequate awareness to select healthy foods (68). Numerous studies represent that family and peers play an important role in feeding behavior of the subjects (69, 70).

There was an inverse significant relationship between perceived barriers and perceived self- care. Rothman by doing a survey on diabetes patients in the United States was showed that inappropriate dietary and wrong habits of sports were in relevance with perceived barriers (71). This issue is similar to Krichbaum study, in this way that; self-care is reduced by increasing perceived barriers (72). Robin also maintained that perceived barrier is the most critical factor of diabetics behavior change in terms of dietary and reported that planners should notice to this factor when make educational intervention (73). Juan and Patti investigation described that perceived barriers has the most powerful relationship with self-care behavior (75, 76).

In this survey, there was an inverse relation between activity related affect and nutritional self-care, in this sense that negative feelings resulted by being patient was reduced self- care. It must be acknowledged that emotions related to behavior were diagnosed as the healthy behavior determinants, recently. Activity related affect is produce a direct emotional reflex or internal response for thinking about behavior that is behavior positive or negative or is that ridiculous, enjoyable or unfavorable? Behaviors that are in accordance with positive feelings may be repeated, whereas those are in relevance with negative feelings may be inhibited. Corbin presents negative feelings in diabetics, comprehensively (77), because this disease threat people identity by labeling of society and augment negative feelings.

Today we know that people's ability to maintain attention and avoid cutting healthy behaviors is different. Behavior of some people may potentially fluctuate more than others and may more easily divert of some activities. It seems that some person despite having knowledge toward healthy dietary take spontaneous preferences when expose to healthy and unhealthy foods. This survey finding means significant inverse relationship between nutritional self- care with immediate competing demands and preferences. Foods preferences that

can be influenced by many of factors are effective in nutritional manner and this issue is obvious in Pirouznia and Naska studies (78, 79). Lerman and Rubin considered patient's preferences and competing factors of self-care as effective criteria for commitment to dietary therapy and in this regard introduced patient's notification to simplicity and complexity of dietary therapy as preferences (80, 81).

Hosseyni esfahani (82) and Kelishadi (83) studies believed that patient's tendency to some unhealthy foods and habits including fried foods that are more desirable describe effective factors for lack of nutritional self- care. Some studies show that people tend to eat foods that do not spend a lot of time to prepare and these desires can be inconsistent with the recommended diet (84, 85). In addition, other studies reported that the reluctance of patients to the self eating or drinking at parties is caused by stigma or reaction by friends (86). In terms of the study limitation, Should be noted that self-report data collected in this study that may not be an accurate description of the variables reported. Another limitation is the fact that the study was cross-sectional, which makes it difficult to determine causality. In contrast, the optimal sample sizes besides standard instrumentation are the strength of the study.

CONCLUSION

The findings reflect the fact that nutritional self-care condition of women with metabolic syndrome in Isfahan was not ideal. Meanwhile, result of the study also showed that factors associated with these behaviors including knowledge, perceived benefits and barriers, perceived self-efficacy, activity related affect, situational influences, spouse social support, commitment to plan of action to the self- care, immediate competing demands and preferences (health promotion model constructs) were not in good condition. According to the results of this study and other similar studies, health promotion model seems likely to be a proper model for designing educational interventions to adopt healthy dietary.

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